UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,469	01/18/2005	Hiroyuki Nakamura	12480-000087/US	2269

30593 7590 06/09/2009

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 8910
RESTON, VA 20195

EXAMINER	
RAMDHANIE, BOBBY	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
06/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,469	NAKAMURA ET AL.	
	Examiner	Art Unit	
	BOBBY RAMDHANIE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-22 and 24-29* is/are pending in the application.

4a) Of the above claim(s) *26-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-22,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 3-25 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection are necessitated by Applicants' amendments to the claims and submission of the explicit English translation document.

Allowable Subject Matter

2. Claims 10 & 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-9, 11-13, 17-19, 21, 22, & 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Cepak et al (J. Mater. Res. 1998).

5. Applicants' claims are toward a method.

6. Regarding Claims 1, 3-9, 11-13, 17-19, 21, 22, & 24, Cepak et al discloses the method of manufacturing a micro reactor device that includes a tubular reactor (Please

See Page 3072; the polyester template membrane has pores which are tubular and can function as a micro reactor Part D & E) as a flow path and allows reaction species to react in the reactor, the method comprising the step of: A). Forming a particle layer including particles on an inner wall of the reactor by causing a dispersion liquid of particles to flow through the reactor (Please See Page 3072; electroless deposition of Au tubules); and B). Drying the reactor (Please See Page 3072; cured in oven).

7. Additional Disclosures Included: Claim 3: Wherein in the particle layer, the particles are aligned regularly (Please See Page 3072; the Au tubules are aligned regularly to the membrane support); Claim 4: Wherein a solvent of the dispersion liquid is a mixed solvent including at least two kinds of solvents (Please See Page 3072; the electroless deposition of the Au tubules are done using an aqueous solution of salts and formaldehyde); Claim 5: Wherein the flow path has a cross section of a round or elliptical shape (Please See Page 3073; Figure 1); Claim 6: Wherein the particles are a catalyst (Please See Page 3072 Au is a catalyst); Claim 7: The method as set forth in claim 1, wherein a catalyst is supported by the particle layer (Please See Page 3072; ZnO is a catalyst that is supported by the Au particle layer; Part F); Claim 8: Wherein the particle layer includes composite particles formed by supporting a functional material by the particles (Please See Page 3072; Part E; 3-mercaptopropyltrimethoxysilane is a functional material); Claim 9: Wherein in the composite particles, the functional material covers the particles (Please See Page 3072; Part E; 3-mercaptopropyltrimethoxysilane is a functional material); Claim 11: Wherein the composite particles are formed by controlling a surface charge of the

particles by a surface-active agent (Please See Page 3072, Part E; pH is a surface-active agent that can control the surface charge); Claim 12: Wherein a hydrophilicity process and a hydrophobicity process are performed on desired regions of the inner wall of the reactor, and a water dispersion liquid of particles is caused to flow through the reactor (Please See Rejections to Claim 1 & Figure 1; c & d); Claim 13: Wherein the particles are a conductive material, and electrodes are formed by sintering the particles (Please See Page 3072; Parts D and E; sintering causes the Au tubules to be electrodes); Claim 17: A micro reactor device, comprising a tubular reactor as a flow path, for allowing reaction species to react in the reactor, the micro reactor device further comprising: A). A particle layer including particles (Please See Page 3072; Parts D & E), provided on an inner wall of the reactor (Please See Page 3072; the membrane acts as the reactor), the particles being composite particles supporting a functional material (Please See Page 3072; Part E); Claim 18: Wherein in the particle layer, the particles are aligned regularly (Please See Page 3072; Parts D & E); Claim 19: Wherein the flow path has a diameter between 1μm and 1mm (Please See Page 3077 Part E); Claim 21: Wherein the particle layer has a thickness of not more than 20μm (Please See Page 3073; Figure 1b); Claim 22: Wherein the particles are a catalyst (Please see Page 3073 Figure 1B; Au is a catalyst); Claim 24: Wherein the composite particles are covered particles that are the particles covered with the functional material (Please See Rejections above and Page 3077; treated Au tubules).

8. Claims 20 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cepak et al.

9. Applicants' claims are toward a method.

10. Regarding Claims 20 & 25, Cepak et al discloses the micro reactor device as set forth in claim 17 respectively, except wherein the particles of the particle layer have a diameter between 1nm and 10 μm. Cepak et al does however disclose that the electroless deposition occurs inside polyester track-etch membranes that are of about 3 μm in diameter (See Page 3071; Part B). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the thickness of the particle layer to be within 1 nm and 10 μm since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

11. Additional Disclosures Included: Claim 25: Wherein the particle layer is patterned (Please See Page 3072; the Au tubules are patterned from the deposition onto the pattern of the membrane wall).

Telephonic Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BOBBY RAMDHANIE whose telephone number is (571)270-3240. The examiner can normally be reached on Mon-Fri 8-5 (Alt Fri off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. R./

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797